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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/961,283	09/25/2001	Hiroyuki Inagaki	Q66363	5322

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EXAMINER

RO, BENTSU

ART UNIT	PAPER NUMBER
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2837

DATE MAILED: 01/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/961,283

Applicant(s)

INAGAKI ET AL.

Examiner

Bentsu Ro

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7,8,11 and 12 is/are allowed.
- 6) ☒ Claim(s) 1-6,9 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

FIRST OFFICE ACTION AFTER RCE

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-4, 9, 10 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by **Jang US Patent No. 6,351,096 B1**.

Claims read onto Jang's teaching as follows:

The claims:

Claim 1. (Currently Amended) A vibration reduction control apparatus for an electric motor comprising:

a detection means for detecting a motor rotational number of the electric motor and outputting a motor rotational number signal based on the motor rotational number;

a band pass filter means for extracting a vibration signal of a predetermined frequency band from the motor rotational number signal; and

Jang's teaching:

Fig. 8 shows a vibration reduction control apparatus for an electric motor;

Fig. 8 shows a speed detector 20A for detecting the rotational number (or speed) of the induction motor 3;
the speed detector 20A outputs a detected motor speed signal to an input device 64;
Fig. 9 shows a portion of Fig. 8, including the input device 64 and the CPU 61;
in Fig. 9, a speed detector 21A is shown, the speed detector 21A measures the motor speed and output a motor speed signal Wr to the input device 64;

as explained previously, in Fig. 8, the components CPU 61 and input device 64 are shown in greater details in Fig. 9;
in Fig. 9, the detected motor speed signal Wr from the speed detector 21A is inputted to the input device 64, the input device 64

a feedback control means for performing a correcting process for the vibration signal passing through the band pass filter means based on the motor rotational number.

Claim 2 (Amended, not original) A vibration reduction control apparatus for an electric motor comprising

a detecting means for detecting a motor rotational number of the electric motor and outputting a motor rotational number signal based on the motor rotational number;

a control means for outputting a torque control signal based on the motor rotational

directly transmits this speed signal W_r to a vibration damping controller 61F; the vibration damping control 61F is shown in details in Fig. 11; now go to Fig. 11, the motor speed signal W_r from the speed detector 21A is inputted to a band pass filter 81; the 81 shown in Fig. 11 is a transfer function of a band pass filter; thus the band pass filter 81 extracts a predetermined frequency band from the motor rotational number signal W_r ;

still in Fig. 11, the output of Fig. 11 is a signal I_{rc} , which signal I_{rc} is a vibration torque compensating current having an amplitude opposite to the motor vibration torque; now go to Fig. 9, this vibration torque compensating current I_{rc} is inputted to a subtractor 61D for correcting the motor vibration torque; thus, the speed detector 21A, the input device 64, the vibration damping controller 61F, the subtractor 61D, the current controller 61E, and the motor 61G (or 11F shown in Fig. 3) constitute a feedback means.

same as claim 1;

same as claim 1;

Fig. 9 shows a speed controller 61C which speed controller 61C is at least a part of the control means;

number signal and controlling the electric motor;

a band pass filter means for extracting a vibration signal of a predetermined frequency band including a frequency band of a disturbance vibration based on the motor rotational number signal detected by the detecting means;

a correcting means for performing a predetermined correcting process which reduces a vibration of the vibration signal for the vibration signal of the predetermined frequency band extracted by the band pass filter means and obtaining a corrected amount; wherein

the control means performs an addition or a subtraction of corrected amount obtained from the correcting means

based on a feedback of the motor rotational number for the torque control signal of the electric motor.

Claim 3. A vibration reduction control apparatus according to claim 1, wherein the predetermined frequency band includes at least a resonance frequency band of the electric motor or an assembled body with the electric motor.

the output of the speed controller 61C is a command current signal I^* ; the command current signal I^* is also a torque control signal because the motor torque is controlled based on the motor current, namely, $(\text{Motor torque}) = (K) \times (\text{motor current})$, wherein K is a constant;

same as that of claim 1;
it is noted that vibration is a type of disturbance;

Fig. 10 shows a step S7 “VIBRATION DAMPING CONTROLLER IS OPERATED (I_{rc} IS OUTPUTTED)”, this step S7 is a correcting means for performing a predetermined correcting process; Fig. 9 shows a vibration damping controller 61F, which also is a correcting means;

Fig. 9 shows a subtractor 61D for correcting the vibration torque compensating current I_{rc} ;
the I_{rc} is therefore is a corrected amount;

the feedback loop is same as that of claim 1.

Fig. 6 shows a vibrational spectrum of a sprocket directly connected to the motor shaft; thus, the vibration spectrum is the vibration spectrum of an assembled body with the electric motor;
it is noted that vibrations are caused by mechanical resonance and the movement of the sprocket creates a mechanical resonance.

Claim 4. A vibration reduction control apparatus according to claim 1, wherein the electric motor is mounted on a vehicle body as a driving source of a vehicle.

In a broad sense, an escalator is a type of vehicle which carries a passenger from one point to another point.

Claim 9.

Basically similar to that of claim 2, discussion is omitted.

Claim 10. A vibration reduction control apparatus according to claim 9, wherein the characteristic fluctuation of the control system includes at least one of difference in driving condition, electric motor type, assembled body assembled with the electric motor, torque ripple, sensor noise, and a steady component of the motor rotational number.

Jang teaches at least a characteristic fluctuation of the motor torque ripple.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jang.

Regarding claims 4 and 5, Jang's feedback control can be used with any other type of systems which requires a vibration reduction, including a vehicle body.

Then why ?? The electric vehicle using an electric motor as a prime source is a well known art. If the electric vehicle to include the Jang's vibration control, then the vehicle will travel more smoothly, as a result, the driver will feel a more comfortable drive.

Because the vibration reduction of Jang has at least the above-mentioned advantage, it would have been obvious to a skilled person in the art to include a vibration reduction control of Jang to an electric vehicle to achieve the same subject matter as claimed.

Regarding claim 6, the PD control is a well known art for feedback loop. See most feedback control textbooks.

5. Claims 7, 8, 11, 12 are allowable.
6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
7. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number 703 308-3656.

January 10, 2004


Bentsu Ro
Primary Examiner